

2005 U.S. Navy Water Quality Data

DEFINITIONS:

- 1. Action Level (AL) - The concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow.
- 2. Maximum Contaminant Level (MCL) - The highest level of a contaminant allowed in drinking water; MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
- 3. Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health; MCLGs allow for a margin of safety.
- 4. Maximum Residual Disinfectant Level (MRDL) - The level of a disinfectant that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects.
- 5. Maximum Residual Disinfectant Level Goal (MRDLG) - The maximum level of a disinfectant added for water treatment at which no known or anticipated adverse health effect would occur; MRDLGs allow for a margin of safety.
- 6. Treatment Technique (TT) - A required process intended to reduce the level of a contaminant in drinking water.
- 7. Reporting Value (RV) - That used for determining compliance with an MCL, and is the highest monthly percentage ratio of sources tested.

ABBREVIATIONS:

ARA - annual running average  
HDCL - highest detected contaminant level  
LDCL - lowest detected contaminant level  
n/a - not applicable  
nd - not detected

ns - no standard  
pCi/L - picocuries per liter  
ppb - parts per billion or micrograms per liter  
ppm - parts per million or milligrams per liter  
ppt - parts per trillion or nanograms per liter

NTU - Nephelometric Turbidity Unit  
IOC - Inorganic Compound  
SOC - Synthetic Organic Compound  
VOC - Volatile Organic Compound

I. PRIMARY STANDARDS, Mandatory, Health-Related Standards, established by GEPA/USEPA								
CONTAMINANT (Units)	MCLG	MCL	LDCL (Date)	HDCL (Date)	ARA	Violation	Major Sources of Contaminant	Locations Detected
Regulated (SOCs), including Pesticides and Herbicides								
2,4 -D (ppb)	70	70	nd (1/9)	0.22 (7/10)	n/a	no	Runoff from herbicides used on row crops	Well NCS-7
Alachlor (ppb)	0	2	nd (1/9)	1.14 (7/10)	n/a	no	Runoff from herbicides used on row crops	Wells NCS-A, NCS-3, NCS-5
Chlordane (ppb)	0	2	nd (1/9)	2.70 (10/30)	1.74 (NCS-5) See Note 1	no	Residue of banned termiticide	Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NRMC-1
Di (2-ethylhexyl) phthalate (ppb)	0	6	nd (1/18)	3.88 (4/11)	n/a	no	Discharge from rubber and chemical factories	Wells NCS-6, NCS-7
Endrin (ppb)	2	2	nd (1/9)	0.03 (4/11)	n/a	no	Residue of banned insecticide	Well NCS-3
Heptachlor epoxide (ppt)	0	200	nd (1/9)	67.0 (1/9)	n/a	no	Breakdown of heptachlor (banned pesticide residue)	Wells NCS-A, NCS-3, NCS-5, NCS-6
Hexachlorocyclopentadiene (ppb)	50	50	nd (1/18)	0.070 (11/13)	n/a	no	Discharge from chemical factories	Fena WTP Clearwell
Regulated (VOCs)								
1,2,4-Trichlorobenzene (ppb)	70	70	nd (1/8)	nd (12/13)	n/a	no	Discharge from textile finishing factories	
Trichloroethylene (ppb)	0	5	nd (1/8)	nd (12/13)	n/a	no	Discharge from metal degreasing sites and other factories	
Regulated (IOCs)								
Arsenic (ppb)	0	50	nd (5/2)	2.40 (5/2)	n/a	no	Erosion of natural deposits	Wells NCS-A, NCS-6
Barium (ppb)	2000	2000	nd (5/2)	nd (5/11)	n/a	no	Discharge of drilling wastes; erosion of natural deposits	
Chromium (ppb)	100	100	nd (5/2)	nd (5/11)	n/a	no	Erosion of natural deposits	
Fluoride (ppm)	4	4	nd (5/2)	0.16 (5/2)	n/a	no	Erosion of natural deposits; water additive which promotes strong teeth	Fena WTP Clearwell, Wells NCS-A, NCS-3, NCS-9A
Nitrate (ppm)	10	10	0.122 (5/2)	3.06 (5/2)	n/a	no	Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits	Fena WTP Clearwell, Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMC-1, NRMC-2
CONTAMINANT (Units)	MCLG	MCL	LDCL (Date)	HDCL (Date)	ARA	Violation	Major Sources of Contaminant	Locations Detected
Radionuclides								
Gross Alpha Activity (pCi/L)	0	15	nd (7/10)	8.40 (11/13)	n/a	no	Erosion of natural deposits	Wells NCS-5, NCS-6
Radium-226 (pCi/L)	0 See Note 2	5 See Note 2	nd (7/10)	2.79 (7/10)	n/a	no	Erosion of natural deposits	Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMC-1
Radium-228 (pCi/L)			nd (7/10)	nd (11/13)	n/a	no	Erosion of natural deposits	None
Uranium (ppb)	0	30	nd (7/10)	nd (11/13)	n/a	no	Erosion of natural deposits	None
Gross Beta Activity (pCi/L)	0	50 See Note 3	nd (7/10)	3.6 (10/30)	n/a	no	Decay of natural and man-made deposits	Wells NCS-A, NCS-5
Strontium-90 (pCi/L)	0 See Note 4	8 See Note 5	nd (7/10)	1.38 (7/10)	n/a	no	Decay of natural and man-made deposits	Wells NCS-5, NCS-9A, NRMC-2
Tritium (pCi/L)	0 See Note 4	20000 See Note 5	nd (7/10)	nd (11/13)	n/a	no	Decay of natural and man-made deposits	None
Disinfection Byproduct (DBPs), Byproduct Precursors, and Disinfectant Residuals								
HAA5 [Five Haloacetic Acids] (ppb)	n/a	60	nd (2/1)	117.5 (8/15)	31.7 See Note 6	no	Byproduct of drinking water chlorination	Distribution systems
TTHMs [Total trihalomethanes] (ppb)	n/a	80	nd (4/19)	93.4 (4/20)	39.3 See Note 6	no	Byproduct of drinking water chlorination	Distribution systems
Chlorine (ppm)	4 (MRDLG)	4 (MRDL)	0 (6/20)	3.3 (10/10)	n/a	no	Water additive used to control microbes	Distribution systems
Control of DBP precursors [Total Organic Carbon, TOC] (% removal ratio ARA)	n/a	TT ≥ 1.0 See Note 7	1.52 (Jul)	1.8 (Oct)	n/a	no	Precursor for byproduct of drinking water chlorination	Fena WTP
Special Monitoring for Sodium								
Sodium (ppm)	n/a	n/a	nd (5/2)	10.1 (5/2)	n/a	no	Salt water intrusion from aquifer/saltwater interface	Well NCS-3
CONTAMINANT (Units)	MCLG	AL	LDCL (Date)	HDCL (Date)	90th Percentile Level	Violation	Major Sources of Contaminant	Locations Detected
Lead and Copper								
Copper (ppb)	1300	1300	24.9 (6/8)	950 (5/20)	580 See Note 8	no	Corrosion of household plumbing systems, erosion of natural deposits, leaching from wood preservatives	Distribution systems
Lead (ppb)	0	15	nd (6/9)	23 (5/19)	4.4 See Note 8	no	Corrosion of household plumbing systems, erosion of natural deposits	Distribution systems (one site exceeded AL)
CONTAMINANT (Units)	MCLG	MCL	RV (Date)		Violation	Major Sources of Contaminant	Locations Detected	
Microbiological Contaminants								
Total Coliform [TC] (% positive per month)	0	5%	2.44% (Nov)		no	Naturally present in the environment	Bldg. 104 (PWC Administration)	
Fecal Coliform [FC]	0	See Note 9	0		no	Human and animal fecal waste	None	
CONTAMINANT (Units)	MCLG	MCL	LDCL (Date)	HDCL (Date)	Violation	Major Sources of Contaminant	Locations Detected	
Turbidity as an Indicator of Filtration Performance								
Turbidity (NTU)	n/a	<0.3 NTU for 95% of samples	100% (Jan)	0.151 (10/8)	no	Soil runoff	Fena WTP	

Note 1: Compliance with chlordane MCL is based on ARA of analytical results obtained at each sampling point.

Note 2: The combined radium (total of radium-226 and radium-228, pCi/L) MCL and MCLG are 5 and 0 respectively

Note 3: The MCL for beta particles is 4 mrem/year dose equivalents to bone marrow. EPA considers the average annual concentration of 50 pCi/L as the level of concern for beta particles.

Note 4: The MCLG for beta particle and photon emitters is 0 pCi/L

Note 5: The MCL values for strontium-90 and tritium are based on annual concentrations assumed to produce a total body or organ dose of 4 mrem/year (40 CFR141.66)

Note 6: Compliance with MCL is based on ARA

Note 7: % removal ratio 12-month ARA, calculated monthly, must be = 1.0

Note 8: 90th percentile level must not exceed Action Level (AL)

Note 9: MCL= a routine and a repeat sample are TC-positive, and at least one is also FC- or *E.coli*-positive

Note 10: < 0.3 NTU in 95% of monthly samples measured every 4 hours

II. SECONDARY STANDARDS*							
CONTAMINANT (Units)	MCLG	MCL	LDCL (Date)	HDCL (Date)	Violation	Major Sources of Contaminant	Locations Detected
Aluminum (ppb)	ns	50-200	nd (4/11)	85.1 (4/11)	no	Naturally occurring in the environment, used in paints, fireworks, glass, rubber, ceramics and as coagulant in water treatment	Fena WTP Clearwell
Iron (ppb)	ns	300	nd (4/11)	303 (4/11)	yes†	Naturally occurring in the environment	Wells NCS-A, NCS-3, NCS-5, NCS-7, NCS-9A
Zinc (ppb)	ns	5000	nd (4/11)	40.0 (4/11)	no	Naturally occurring in the environment, dry cell battery, paint, ceramic, and rubber production, corrosion inhibitor	Wells NCS-A, NCS-5, NCS-6, NCS-7, NCS-9A, NRMCMC-2
Manganese (ppb)	ns	50	nd (4/11)	4.29 (4/11)	no	Naturally occurring in the environment, battery and ceramic production, pesticides, fertilizers	Well NCS-9A
Copper (ppb)	ns	1000	nd (4/11)	42.0 (4/11)	no	Naturally occurring in the environment, used to treat plant diseases (mildew), or as preservatives for wood, leather, fabrics	Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMCMC-1, NRMCMC-2
Silver (ppb)	ns	100	nd (4/11)	1.94 (4/11)	no	Waste from metal plating and/or photographic plating activities, also used as an antibacterial agent in home water treatment devices	Well NCS-3
Chlorides (ppm)	ns	250	11.5 (11/13)	168.0 (4/11)	no	Saltwater intrusion from aquifer / saltwater interface	Fena WTP Clearwell, Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMCMC-1, NRMCMC-2
Sulfate (ppm)	ns	250	7.19 (11/13)	43.5 (10/30)	no	Naturally occurring in the environment	Fena WTP Clearwell, Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMCMC-1, NRMCMC-2
Total Dissolved Solids (ppm)	ns	500	153 (11/13)	606 (4/11)	yes†	Erosion and soil runoff	Fena WTP Clearwell, Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMCMC-1, NRMCMC-2
Color (color units)	ns	15	1 (4/11)	4 (11/13)	no	Organic compounds which are naturally occurring in Fena Lake and groundwater	Fena WTP Clearwell, Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMCMC-1, NRMCMC-2
Odor	ns	3 TON See Note 11	C1 (4/11) See Note 12	E1 (11/13) See Note 13	no	Organic compounds which are naturally occurring in Fena Lake and groundwater	Fena WTP Clearwell, Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMCMC-1, NRMCMC-2
pH	n/a	6.5 to 8.5	7.00 (11/13)	8.01 (4/11)	no	Organic compounds which are naturally occurring in Fena Lake and groundwater	Fena WTP Clearwell, Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMCMC-1, NRMCMC-2
Corrosivity	n/a	non-corrosive	0.82 (4/11)	-1.22 (11/13)	yes†	Organic compounds which are naturally occurring in Fena Lake and groundwater	Fena WTP Clearwell, Wells NCS-A, NCS-3, NCS-5, NCS-6, NCS-7, NCS-9A, NRMCMC-1, NRMCMC-2
Surfactants (ppm)	ns	0.5	nd (4/3)	nd (11/13)	no	Foaming agents commonly found in detergent and/or similar substances	None
Fluoride (ppm)	n/a	2	nd (4/11)	0.17 (10/30)	no	Erosion of natural deposits; water additive which promotes strong teeth	Fena WTP Clearwell, Wells NCS-7, NCS-9A, NRMCMC-1, NRMCMC-2

\* Secondary MCL monitoring helps in determining areas in need of adjustment, additional maintenance, or rehabilitation, in order to provide a high quality water that appeals to the consumer.  
† Exceedance of an aesthetic standard. No adverse health effects associated with these parameters.  
Note 11: TON = Threshold Odor Number or the dilution ratio at which taste or odor is just detectable. The smallest TON that can be observed is 1.  
Note 12: C1 denotes the water sample has a very faint chlorine smell with a TON of 1.  
Note 13: E1 denotes the water sample has a very faint "earthy" smell with a TON of 1.

III. SUMMARY OF REQUIRED MONITORING					
Compound	Monitoring Period	Date(s) Sampled	Violation	Health Effects	Remarks
Chlorine	January-December	7/27-8/3	yes	Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. See also Section IV, "Disinfection By-Product Precursors and Disinfectant Residuals"	Tier 3 monitoring violation. Fena WTP failed to restore continuous chlorine analyzer within the 5-day requirement of the Interim Enhanced Surface Water Treatment Rule.
Radionuclides	July-December	7/10, 10/30, 11/6, 11/13	no	See Section IV, "Radionuclides"	Quarterly monitoring began 3rd Quarter 2005.
SOC	January-December	8/23-10/30	no	See Section IV, "Regulated SOC's"	Despite excessive chlordane levels detected at Well NCS-5 during the 3rd and 4th Quarter, ARA did not exceed the MCL. NCS-5 was secured on 29 November 2005 and is currently being monitored monthly for chlordane.
Total Coliform	January-December	5/30	no	See Section IV, "Microbiological Contaminants"	Bacteriological analysis for the Fena WTP was not performed according to the regular weekday schedule. Requirement for minimum number of samples analyzed was met.

IV. CONTAMINANTS AND RELATED HEALTH EFFECTS	
Regulated (SOCs), including Pesticides and Herbicides	
Alachlor	Some people who drink water containing alachlor in excess of the MCL over many years could experience problems with their eyes, liver, kidneys or spleen; could have an increased risk of getting cancer and may experience anemia.
2,4 D	Some people who drink water containing 2,4 D in excess of the MCL over many years could experience problems with their kidneys, liver or adrenal glands.
Chlordane	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and could have an increased risk of getting cancer.
Di(2-ethylhexyl) phthalate	Some people who drink water containing di(2-ethylhexyl) phthalate in excess of the MCL over many years could experience reproductive difficulties, problems with their liver, and may have an increased risk of getting cancer.
Endrin	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
Heptachlor epoxide	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and could have an increased risk of getting cancer.
Hexachloro-cyclopentadiene	Some people who drink water containing hexachlorocyclopentadiene in excess of the MCL over many years could experience kidney or stomach problems.
Regulated (VOCs)	
5 Haloacetic Acids (HAA5)	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
TTHMs [Total trihalomethanes]	Some people who drink water containing trihalomethanes in excess of the MCL over many years could experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
1,2,4-Trichlorobenzene	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
Trichloroethylene	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
Regulated (IOCs)	
Arsenic	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
Fluoride	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
Nitrate	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Radionuclides	
Gross Alpha Activity	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Gross Beta Activity	Certain minerals are radioactive and may emit a form of radiation known as beta radiation. Some people who drink water containing beta particles in excess of the MCL over many years may have an increased risk of getting cancer.
Radium-226	Some people who drink water containing Radium-226 in excess of the MCL over many years may have an increased risk of getting cancer.
Strontium-90	Certain minerals are radioactive and may emit forms of radiation known as photons. Some people who drink water containing Strontium-90 (photon emitter) in excess of the MCL over many years may have increased risk of getting cancer.
Disinfection By-Product Precursors and Disinfectant Residuals	
Chlorine	Some people who use drinking water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
Control of DBP precursors (TOC)	Total Organic Carbon (TOC) has no health effects. However, TOC provides a medium for the formation of DBPs. These byproducts include TriHaloMethanes (THMs) and HaloAcetic Acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
Special Monitoring for Sodium	
Sodium	Remarks: See 40 CFR Part 141, Section 141.41(c).
Lead and Copper	
Copper	Copper is an essential nutrient. However, some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress.
Lead	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Microbiological Contaminants	
Total Coliform [TC]	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other potentially harmful bacteria may be present. If coliforms are found in more samples than allowed, this is a warning of potential problems.
Fecal Coliform [FC] / E. coli	Fecal coliforms and E.coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely-compromised immune systems.
Turbidity as an Indicator of Filtration Performance	
Turbidity	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.